

#7

SEQUENCE LISTING

<110> Pantherix Limited
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<120> Crystal Structures of Chorismate Synthase

<130> 7182-1

<140> US/10/529,196

<141> 2005-03-24

<160> 19

<170> PatentIn version 3.3

<210> 1

<211> 359

<212> PRT

<213> Escherichia coli

<400> 1

Ala Gly Asn Thr Ile Gly Gln Leu Phe Arg Val Thr Thr Phe Gly Glu
1 5 10 15

Ser His Gly Leu Ala Leu Gly Cys Ile Val Asp Gly Val Pro Pro Gly
20 25 30

Ile Pro Leu Thr Gln Ala Asp Leu Gln His Asp Leu Asp Arg Arg Arg
35 40 45

Pro Gly Thr Arg Tyr Thr Thr Gln Arg Arg Glu Pro Asp Gln Val Lys
50 55 60

Ile Leu Ser Gly Val Phe Glu Gly Val Thr Thr Gly Thr Ser Ile Gly
65 70 75 80

Leu Leu Ile Glu Asn Thr Asp Gln Arg Ser Gln Asp Tyr Ser Ala Ile
85 90 95

Lys Asp Val Phe Arg Pro Gly His Ala Asp Tyr Thr Tyr Glu Gln Lys
100 105 110

Tyr Gly Leu Arg Asp Tyr Arg Gly Gly Gly Arg Ser Ser Ala Arg Glu
115 120 125

Thr Ala Met Arg Val Ala Ala Gly Ala Ile Ala Lys Lys Tyr Leu Ala
130 135 140

Glu Lys Phe Gly Ile Glu Ile Arg Gly Cys Leu Thr Gln Met Gly Asp
145 150 155 160

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Ile Pro Leu Asp Ile Lys Asp Trp Ser Gln Val Glu Gln Asn Pro Phe
165 170 175

Phe Cys Pro Asp Pro Asp Lys Ile Asp Ala Leu Asp Glu Leu Met Arg
180 185 190

Ala Leu Lys Lys Glu Gly Asp Ser Ile Gly Ala Lys Val Thr Val Val
195 200 205

Ala Ser Gly Val Pro Ala Gly Leu Gly Glu Pro Val Phe Asp Arg Leu
210 215 220

Asp Ala Asp Ile Ala His Ala Leu Met Ser Ile Asn Ala Val Lys Gly
225 230 235 240

Val Glu Ile Gly Asp Gly Phe Asp Val Val Ala Leu Arg Gly Ser Gln
245 250 255

Asn Arg Asp Glu Ile Thr Lys Asp Gly Phe Gln Ser Asn His Ala Gly
260 265 270

Gly Ile Leu Gly Gly Ile Ser Ser Gly Gln Gln Ile Ile Ala His Met
275 280 285

Ala Leu Lys Pro Thr Ser Ser Ile Thr Val Pro Gly Arg Thr Ile Asn
290 295 300

Arg Phe Gly Glu Glu Val Glu Met Ile Thr Lys Gly Arg His Asp Pro
305 310 315 320

Cys Val Gly Ile Arg Ala Val Pro Ile Ala Glu Ala Met Leu Ala Ile
325 330 335

Val Leu Met Asp His Leu Leu Arg Gln Arg Ala Gln Asn Ala Asp Val
340 345 350

Lys Thr Asp Ile Pro Arg Trp
355

<210> 2
<211> 388
<212> PRT
<213> Streptococcus pneumoniae
<400> 2

Met Arg Tyr Leu Thr Ala Gly Glu Ser His Gly Pro Arg Leu Thr Ala
1 5 10 15

E.coli. seq. 1.ST25.txt complete 3.15.2006

Ile Ile Glu Gly Ile Pro Ala Gly Leu Pro Leu Thr Ala Glu Asp Ile
20 25 30

Asn Glu Asp Leu Arg Arg Arg Gln Gly Gly Tyr Gly Arg Gly Gly Arg
35 40 45

Met Lys Ile Glu Asn Asp Gln Val Val Phe Thr Ser Gly Val Arg His
50 55 60

Gly Lys Thr Thr Gly Ala Pro Ile Thr Met Asp Val Ile Asn Lys Asp
65 70 75 80

His Gln Lys Trp Leu Asp Ile Met Ser Ala Glu Asp Ile Glu Asp Arg
85 90 95

Leu Lys Ser Lys Arg Lys Ile Thr His Pro Arg Pro Gly His Ala Asp
100 105 110

Leu Val Gly Gly Ile Lys Tyr Arg Phe Asp Asp Leu Arg Asn Ser Leu
115 120 125

Glu Arg Ser Ser Ala Arg Glu Thr Thr Met Arg Val Ala Val Gly Ala
130 135 140

Val Ala Lys Arg Leu Leu Ala Glu Leu Asp Met Glu Ile Ala Asn His
145 150 155 160

Val Val Val Phe Gly Gly Lys Glu Ile Asp Val Pro Glu Asn Leu Thr
165 170 175

Val Ala Glu Ile Lys Gln Arg Ala Ala Gln Ser Glu Val Ser Ile Val
180 185 190

Asn Gln Glu Arg Glu Gln Glu Ile Lys Asp Tyr Ile Asp Gln Ile Lys
195 200 205

Arg Asp Gly Asp Thr Ile Gly Gly Val Val Glu Thr Val Val Gly Gly
210 215 220

Val Pro Val Gly Leu Gly Ser Tyr Val Gln Trp Asp Arg Lys Leu Asp
225 230 235 240

Ala Arg Leu Ala Gln Ala Val Val Ser Ile Asn Ala Phe Lys Gly Val
245 250 255

Glu Phe Gly Leu Gly Phe Glu Ala Gly Tyr Arg Lys Gly Ser Gln Val
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265

270

Met Asp Glu Ile Leu Trp Ser Lys Glu Asp Gly Tyr Thr Arg Arg Thr
 275 280 285

Asn Asn Leu Gly Gly Phe Glu Gly Gly Met Thr Asn Gly Gln Pro Ile
 290 295 300

Val Val Arg Gly Val Met Lys Pro Ile Pro Thr Leu Tyr Lys Pro Leu
 305 310 315 320

Met Ser Val Asp Ile Glu Thr His Glu Pro Tyr Lys Ala Thr Val Glu
 325 330 335

Arg Ser Asp Pro Thr Ala Leu Pro Ala Ala Gly Met Val Met Glu Ala
 340 345 350

Val Val Ala Thr Val Leu Ala Gln Glu Ile Leu Glu Lys Phe Ser Ser
 355 360 365

Asp Asn Leu Glu Glu Leu Lys Glu Ala Val Ala Lys His Arg Asp Tyr
 370 375 380

Thr Lys Asn Tyr
 385

<210> 3
 <211> 388
 <212> PRT
 <213> Enterococcus faecalis

<400> 3

Met Arg Phe Ile Thr Ala Gly Glu Ser His Gly Pro Glu Leu Thr Ala
 1 5 10 15

Ile Ile Glu Gly Leu Pro Ala Gly Leu Pro Leu Ser Ser Glu Glu Ile
 20 25 30

Asn Arg Glu Leu Ala Arg Arg Gln Gly Gly Tyr Gly Arg Gly Gly Arg
 35 40 45

Met Lys Ile Glu Lys Asp Gln Val Arg Ile Thr Ser Gly Ile Arg His
 50 55 60

Gly Lys Thr Leu Gly Ser Pro Val Thr Leu Ile Val Glu Asn Lys Asp
 65 70 75 80

Trp Lys Asn Trp Thr Ser Val Met Ser Val Glu Pro Val Pro Glu Lys
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Gln Lys Lys Ile Arg Arg Val Ser Lys Pro Arg Pro Gly His Ala Asp
100 105 110

Leu Val Gly Gly Met Lys Tyr Gln His Asp Asp Leu Arg Asn Val Leu
115 120 125

Glu Arg Ser Ser Ala Arg Glu Thr Thr Met Arg Val Ala Ile Gly Ala
130 135 140

Val Ala Lys Lys Leu Leu Ala Glu Leu Asp Ile Gln Val Ala Gly His
145 150 155 160

Val Ala Val Leu Gly Gly Ile Glu Ala Thr Ile Pro Glu Asn Leu Thr
165 170 175

Ile Arg Glu Ile Gln Glu Arg Ser Glu Gln Ser Ala Val Arg Val Leu
180 185 190

Asp Pro Ser Val Glu Glu Lys Met Lys Glu Leu Ile Asp Gln Thr Lys
195 200 205

Lys Asn Gly Asp Thr Ile Gly Gly Val Val Glu Val Leu Val Gly Gly
210 215 220

Val Pro Ala Gly Leu Gly Ser Tyr Val Gln Trp Asp Arg Lys Leu Asp
225 230 235 240

Ala Lys Ile Ala Gln Ala Val Val Ser Ile Asn Ala Phe Thr Gly Ala
245 250 255

Glu Phe Gly Ile Gly Phe Glu Met Ala Gln Arg Ile Gly Ser Gln Leu
260 265 270

Met Asp Glu Ile Val Trp Asp Glu Ser Thr Gly Tyr Thr Arg Thr Ser
275 280 285

Asn Asn Leu Gly Gly Phe Glu Gly Gly Met Thr Asn Gly Met Pro Ile
290 295 300

Ile Val Arg Gly Val Met Lys Pro Ile Pro Thr Leu Tyr Lys Pro Leu
305 310 315 320

Gln Ser Val Asn Ile Asp Thr Lys Glu Pro Tyr Lys Ala Ser Val Glu
325 330 335

E.coli. seq. 1.ST25.txt complete 3.15.2006

Arg Ser Asp Ser Thr Ala Val Pro Ala Ala Ser Val Val Cys Glu Ala
340 345 350

Val Val Ala Thr Glu Val Ala Lys Ala Met Leu Glu Lys Phe Asp Ser
355 360 365

Asp Ser Phe Glu Gln Met Lys Glu Ala Val Lys Arg Tyr Arg Leu Tyr
370 375 380

Thr Gln Asn Phe
385

<210> 4
<211> 388
<212> PRT
<213> Staphylococcus aureus
<400> 4

Met Arg Tyr Leu Thr Ser Gly Glu Ser His Gly Pro Gln Leu Thr Val
1 5 10 15

Ile Val Glu Gly Val Pro Ala Asn Leu Glu Val Lys Val Glu Asp Ile
20 25 30

Asn Lys Glu Met Phe Lys Arg Gln Gly Gly Tyr Gly Arg Gly Arg Arg
35 40 45

Met Gln Ile Glu Lys Asp Thr Val Glu Ile Val Ser Gly Val Arg Asn
50 55 60

Gly Tyr Thr Leu Gly Ser Pro Ile Thr Met Val Val Thr Asn Asp Asp
65 70 75 80

Phe Thr His Trp Arg Lys Ile Met Gly Arg Ala Pro Ile Ser Asp Glu
85 90 95

Glu Arg Glu Asn Met Lys Arg Thr Ile Thr Lys Pro Arg Pro Gly His
100 105 110

Ala Asp Leu Leu Gly Gly Met Lys Tyr Asn His Arg Asp Leu Arg Asn
115 120 125

Val Leu Glu Arg Ser Ser Ala Arg Glu Thr Ala Ala Arg Val Ala Val
130 135 140

Gly Ala Leu Cys Lys Val Leu Leu Glu Gln Leu Asp Ile Glu Ile Tyr
145 150 155 160

E.coli. seq. 1.ST25.txt complete 3.15.2006

Ser Arg Val Val Glu Ile Gly Gly Ile Lys Asp Lys Asp Phe Tyr Asp
165 170 175

Ser Glu Thr Phe Lys Ala Asn Leu Asp Arg Asn Asp Val Arg Val Ile
180 185 190

Asp Asp Gly Ile Ala Gln Ala Met Arg Asp Lys Ile Asp Glu Ala Lys
195 200 205

Thr Asp Gly Asp Ser Ile Gly Gly Val Val Gln Val Val Val Glu Asn
210 215 220

Met Pro Val Gly Val Gly Ser Tyr Val His Tyr Asp Arg Lys Leu Asp
225 230 235 240

Gly Arg Ile Ala Gln Gly Val Val Ser Ile Asn Ala Phe Lys Gly Val
245 250 255

Ser Phe Gly Glu Gly Phe Lys Ala Ala Glu Lys Pro Gly Ser Glu Ile
260 265 270

Gln Asp Glu Ile Leu Tyr Asn Thr Glu Leu Gly Tyr Tyr Arg Gly Ser
275 280 285

Asn His Leu Gly Gly Leu Glu Gly Gly Met Ser Asn Gly Met Pro Ile
290 295 300

Ile Val Asn Gly Val Met Lys Pro Ile Pro Thr Leu Tyr Lys Pro Leu
305 310 315 320

Asn Ser Val Asp Ile Asn Thr Lys Glu Asp Phe Lys Ala Thr Ile Glu
325 330 335

Arg Ser Asp Ser Cys Ala Val Pro Ala Ala Ser Ile Val Cys Glu His
340 345 350

Val Val Ala Phe Ala Ile Ala Lys Ala Leu Leu Glu Glu Phe Gln Ser
355 360 365

Asn His Ile Glu Gln Leu Lys Gln Gln Ile Ile Glu Arg Arg Gln Leu
370 375 380

Asn Val Glu Phe
385

<210> 5
<211> 368
<212> PRT

E.coli. seq. 1.ST25.txt complete 3.15.2006
<213> Bacillus subtilis

<400> 5

Met Arg Tyr Leu Thr Ala Gly Glu Ser His Gly Pro Gln Leu Thr Thr
1 5 10 15

Ile Ile Glu Gly Val Pro Ala Gly Leu Tyr Ile Thr Glu Glu Asp Ile
20 25 30

Asn Phe Glu Leu Ala Arg Arg Gln Lys Gly His Gly Arg Gly Arg Arg
35 40 45

Met Gln Ile Glu Lys Asp Gln Ala Lys Ile Met Ser Gly Val Arg His
50 55 60

Ala Arg Thr Leu Gly Ser Pro Ile Ala Leu Val Val Glu Asn Asn Asp
65 70 75 80

Trp Lys His Trp Thr Lys Ile Met Gly Ala Ala Pro Ile Thr Glu Asp
85 90 95

Glu Glu Lys Glu Met Lys Arg Gln Ile Ser Arg Pro Arg Pro Gly His
100 105 110

Ala Asp Leu Asn Gly Ala Ile Lys Tyr Asn His Arg Asp Met Arg Asn
115 120 125

Val Leu Glu Arg Ser Ser Ala Arg Glu Thr Thr Val Arg Val Ala Ala
130 135 140

Gly Ala Val Ala Lys Lys Ile Leu Ser Glu Leu Gly Ile Lys Val Ala
145 150 155 160

Gly His Val Leu Gln Ile Gly Ala Val Lys Ala Glu Lys Thr Gly Tyr
165 170 175

Thr Ser Ile Glu Asp Leu Gln Arg Val Thr Glu Glu Ser Pro Val Arg
180 185 190

Cys Tyr Asp Glu Glu Ala Gly Lys Lys Met Met Ala Ala Ile Asp Glu
195 200 205

Ala Lys Ala Asn Gly Asp Ser Ile Gly Gly Ile Val Glu Val Ile Val
210 215 220

Glu Gly Met Pro Val Gly Val Gly Ser Tyr Val His Tyr Asp Arg Lys
225 230 235 240

E.coli. seq. 1.ST25.txt complete 3.15.2006

Leu Asp Ser Lys Leu Ala Ala Ala Val Leu Ser Ile Asn Ala Phe Lys
245 250 255

Gly Val Glu Phe Gly Ile Gly Phe Glu Ala Ala Gly Arg Asn Gly Ser
260 265 270

Glu Val His Asp Glu Ile Ile Trp Asp Glu Glu Lys Gly Tyr Thr Arg
275 280 285

Ala Thr Asn Arg Leu Gly Gly Leu Glu Gly Gly Met Thr Thr Gly Met
290 295 300

Pro Ile Val Val Arg Gly Val Met Lys Pro Ile Pro Thr Leu Tyr Lys
305 310 315 320

Pro Leu Lys Ser Val Asp Ile Glu Thr Lys Glu Pro Phe Ser Ala Ser
325 330 335

Ile Glu Arg Ser Asp Ser Cys Ala Val Pro Ala Ala Ser Val Val Ala
340 345 350

Glu Ala Leu Ser Leu Gly Lys Leu Gln Pro Ser Leu Asn Asn Ser Asp
355 360 365

<210> 6
<211> 527
<212> PRT
<213> Plasmodium falciparum

<400> 6

Met Ser Thr Tyr Gly Thr Leu Leu Lys Val Thr Ser Tyr Gly Glu Ser
1 5 10 15

His Gly Lys Ala Ile Gly Cys Val Ile Asp Gly Phe Leu Ser Asn Ile
20 25 30

Glu Ile Asn Phe Asp Leu Ile Gln Lys Gln Leu Asp Arg Arg Arg Pro
35 40 45

Asn Gln Ser Lys Leu Thr Ser Asn Arg Asn Glu Lys Asp Lys Leu Val
50 55 60

Ile Leu Ser Gly Phe Asp Glu Asn Lys Thr Leu Gly Thr Pro Ile Thr
65 70 75 80

Phe Leu Ile Tyr Asn Glu Asp Ile Lys Lys Glu Asp Tyr Asn Ser Phe
85 90 95

E.coli. seq. 1.ST25.txt complete 3.15.2006

Ile Asn Ile Pro Arg Pro Gly His Gly Asp Tyr Thr Tyr Phe Met Lys
100 105 110

Tyr His Val Lys Asn Lys Ser Gly Ser Ser Arg Phe Ser Gly Arg Glu
115 120 125

Thr Ala Thr Arg Val Ala Ala Gly Ala Cys Ile Glu Gln Trp Leu Tyr
130 135 140

Lys Ser Tyr Asn Cys Ser Ile Val Ser Tyr Val His Ser Val Gly Asn
145 150 155 160

Ile Lys Ile Pro Glu Gln Val Ser Lys Glu Leu Glu Asn Lys Asn Pro
165 170 175

Pro Ser Arg Asp Leu Val Asp Ser Tyr Gly Thr Val Arg Tyr Asn Glu
180 185 190

Lys Glu Lys Ile Phe Met Asp Cys Phe Asn Arg Ile Tyr Asp Met Asn
195 200 205

Ala Ser Met Leu Lys Thr Asp Glu Tyr Asn Lys Asn Thr Leu Thr Ile
210 215 220

Pro Ser Ile Asp Asn Thr Tyr Ile Asn Val Lys Thr Asn Glu Cys Asn
225 230 235 240

Ile Asn Gln Val Asp Asn Asn His Asn Asn Tyr Ile Asn Asp Lys Asp
245 250 255

Asn Thr Phe Asn Asn Ser Glu Lys Ser Asp Glu Trp Ile Tyr Leu Gln
260 265 270

Thr Arg Cys Pro His Pro Tyr Thr Ala Val Gln Ile Cys Ser Tyr Ile
275 280 285

Leu Lys Leu Lys Asn Lys Gly Asp Ser Val Gly Gly Ile Ala Thr Cys
290 295 300

Ile Ile Gln Asn Pro Pro Ile Gly Ile Gly Glu Pro Ile Phe Asp Lys
305 310 315 320

Leu Glu Ala Glu Leu Ala Lys Met Ile Leu Ser Ile Pro Pro Val Lys
325 330 335

Gly Ile Glu Phe Gly Ser Gly Phe Asn Gly Thr Tyr Met Phe Gly Ser
340 345 350

E.coli. seq. 1.ST25.txt complete 3.15.2006

Met His Asn Asp Ile Phe Ile Pro Val Glu Asn Met Ser Thr Lys Lys
355 360 365

Glu Ser Asp Leu Leu Tyr Asp Asp Lys Gly Glu Cys Lys Asn Met Ser
370 375 380

Tyr His Ser Thr Ile Gln Asn Asn Glu Asp Gln Ile Leu Asn Ser Thr
385 390 395 400

Lys Gly Phe Met Pro Pro Lys Asn Asp Lys Asn Phe Asn Asn Ile Asp
405 410 415

Asp Tyr Asn Val Thr Phe Asn Asn Asn Glu Glu Lys Leu Leu Ile Thr
420 425 430

Lys Thr Asn Asn Cys Gly Gly Ile Leu Ala Gly Ile Ser Thr Gly Asn
435 440 445

Asn Ile Val Phe Arg Ser Ala Ile Lys Pro Val Ser Ser Ile Gln Ile
450 455 460

Glu Lys Glu Thr Ser Asp Phe Tyr Gly Asn Met Cys Asn Leu Lys Val
465 470 475 480

Gln Gly Arg His Asp Ser Cys Ile Leu Pro Arg Leu Pro Pro Ile Ile
485 490 495

Glu Ala Ser Ser Ser Met Val Ile Gly Asp Leu Ile Leu Arg Gln Ile
500 505 510

Ser Lys Tyr Gly Asp Lys Lys Leu Pro Thr Leu Phe Arg Asn Met
515 520 525

<210> 7
<211> 401
<212> PRT
<213> Mycobacterium tuberculosis

<400> 7

Met Leu Arg Trp Ile Thr Ala Gly Glu Ser His Gly Arg Ala Leu Val
1 5 10 15

Ala Val Val Glu Gly Met Val Ala Gly Val His Val Thr Ser Ala Asp
20 25 30

Ile Ala Asp Gln Leu Ala Arg Arg Arg Leu Gly Tyr Gly Arg Gly Ala
35 40 45

E.coli. seq. 1.ST25.txt complete 3.15.2006

Arg Met Thr Phe Glu Arg Asp Ala Val Thr Val Leu Ser Gly Ile Arg
50 55 60

His Gly Ser Thr Leu Gly Gly Pro Ile Ala Ile Glu Ile Gly Asn Thr
65 70 75 80

Glu Trp Pro Lys Trp Glu Thr Val Met Ala Ala Asp Pro Val Asp Pro
85 90 95

Ala Glu Leu Ala Asp Val Ala Arg Asn Ala Pro Leu Thr Arg Pro Arg
100 105 110

Pro Gly His Ala Asp Tyr Ala Gly Met Leu Lys Tyr Gly Phe Asp Asp
115 120 125

Ala Arg Pro Val Leu Glu Arg Ala Ser Ala Arg Glu Thr Ala Ala Arg
130 135 140

Val Ala Ala Gly Thr Val Ala Arg Ala Phe Leu Arg Gln Ala Leu Gly
145 150 155 160

Val Glu Val Leu Ser His Val Ile Ser Ile Gly Ala Ser Ala Pro Tyr
165 170 175

Glu Gly Pro Pro Pro Arg Ala Glu Asp Leu Pro Ala Ile Asp Ala Ser
180 185 190

Pro Val Arg Ala Tyr Asp Lys Ala Ala Glu Ala Asp Met Ile Ala Gln
195 200 205

Ile Glu Ala Ala Lys Lys Asp Gly Asp Thr Leu Gly Gly Val Val Glu
210 215 220

Ala Val Ala Leu Gly Leu Pro Val Gly Leu Gly Ser Phe Thr Ser Gly
225 230 235 240

Asp His Arg Leu Asp Ser Gln Leu Ala Ala Ala Val Met Gly Ile Gln
245 250 255

Ala Ile Lys Gly Val Glu Ile Gly Asp Gly Phe Gln Thr Ala Arg Arg
260 265 270

Arg Gly Ser Arg Ala His Asp Glu Met Tyr Pro Gly Pro Asp Gly Val
275 280 285

Val Arg Ser Thr Asn Arg Ala Gly Gly Leu Glu Gly Gly Met Thr Asn
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290

295

300

Gly Gln Pro Leu Arg Val Arg Ala Ala Met Lys Pro Ile Ser Thr Val
 305 310 315 320

Pro Arg Ala Leu Ala Thr Val Asp Leu Ala Thr Gly Asp Glu Ala Val
 325 330 335

Ala Ile His Gln Arg Ser Asp Val Cys Ala Val Pro Ala Ala Gly Val
 340 345 350

Val Val Glu Thr Met Val Ala Leu Val Leu Ala Arg Ala Ala Leu Glu
 355 360 365

Lys Phe Gly Gly Asp Ser Leu Ala Glu Thr Gln Arg Asn Ile Ala Ala
 370 375 380

Tyr Gln Arg Ser Val Ala Asp Arg Glu Ala Pro Ala Ala Arg Val Ser
 385 390 395 400

Gly

<210> 8

<211> 360

<212> PRT

<213> Salmonella enterica

<400> 8

Ala Gly Asn Thr Ile Gly Gln Leu Phe Arg Val Thr Thr Phe Gly Glu
 1 5 10 15

Ser His Gly Leu Ala Val Gly Gly Ile Val Asp Gly Val Pro Pro Gly
 20 25 30

Ile Pro Leu Thr Glu Ala Asp Leu Gln His Asp Leu Asp Arg Arg Arg
 35 40 45

Pro Gly Thr Ser Arg Tyr Thr Thr Gln Arg Arg Glu Pro Asp Gln Val
 50 55 60

Lys Ile Leu Ser Gly Val Phe Asp Gly Val Thr Thr Gly Thr Ser Ile
 65 70 75 80

Gly Leu Leu Ile Glu Asn Thr Asp Gln Arg Ser Gln Asp Tyr Ser Ala
 85 90 95

Ile Lys Asp Val Phe Arg Pro Gly His Ala Asp Tyr Thr Tyr Glu Gln
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100

105

110

Lys Tyr Gly Leu Arg Asp Tyr Arg Gly Gly Gly Arg Ser Ser Ala Arg
 115 120 125

Glu Thr Ala Met Arg Val Ala Ala Gly Ala Ile Ala Lys Lys Tyr Leu
 130 135 140

Ala Glu Lys Phe Gly Ile Glu Ile Arg Gly Cys Leu Thr Gln Met Gly
 145 150 155 160

Asp Ile Pro Leu Glu Ile Lys Asp Trp Arg Gln Val Glu Leu Asn Pro
 165 170 175

Phe Phe Cys Pro Asp Ala Asp Lys Leu Asp Ala Leu Asp Glu Leu Met
 180 185 190

Arg Ala Leu Lys Lys Glu Gly Asp Ser Ile Gly Ala Lys Val Thr Val
 195 200 205

Met Ala Ser Gly Val Pro Ala Gly Leu Gly Glu Pro Val Phe Asp Arg
 210 215 220

Leu Asp Ala Asp Ile Ala His Ala Leu Met Ser Ile Asn Ala Val Lys
 225 230 235 240

Gly Val Glu Ile Gly Glu Gly Phe Asn Val Val Ala Leu Arg Gly Ser
 245 250 255

Gln Asn Arg Asp Glu Ile Thr Ala Gln Gly Phe Gln Ser Asn His Ala
 260 265 270

Gly Gly Ile Leu Gly Gly Ile Ser Ser Gly Gln His Ile Val Ala His
 275 280 285

Met Ala Leu Lys Pro Thr Ser Ser Ile Thr Val Pro Gly Arg Thr Ile
 290 295 300

Asn Arg Met Gly Glu Glu Val Glu Met Ile Thr Lys Gly Arg His Asp
 305 310 315 320

Pro Cys Val Gly Ile Arg Ala Val Pro Ile Ala Glu Ala Met Leu Ala
 325 330 335

Ile Val Leu Met Asp His Leu Leu Arg His Arg Ala Gln Asn Ala Asp
 340 345 350

Val Lys Thr Glu Ile Pro Arg Trp
355 360

<210> 9
<211> 360
<212> PRT
<213> yersinia pestis

<400> 9

Ala Gly Asn Ser Ile Gly Gln Phe Phe Arg Val Thr Thr Phe Gly Glu
1 5 10 15

Ser His Gly Ile Ala Leu Gly Cys Ile Ile Asp Gly Val Pro Pro Gly
20 25 30

Ile Pro Ile Thr Glu Ala Asp Ile Gln Leu Asp Leu Asp Arg Arg Arg
35 40 45

Pro Gly Thr Ser Arg Tyr Thr Thr Gln Arg Arg Glu Leu Asp Gln Val
50 55 60

Arg Ile Leu Ser Gly Val Phe Glu Gly Val Thr Thr Gly Thr Ser Ile
65 70 75 80

Gly Leu Met Ile Glu Asn Thr Asp Gln Arg Ser Gln Asp Tyr Ser Ala
85 90 95

Ile Lys Asp Val Phe Arg Pro Gly His Ala Asp Tyr Thr Tyr Glu Gln
100 105 110

Lys Tyr Gly Val Arg Asp Tyr Arg Gly Gly Gly Arg Ser Ser Ala Arg
115 120 125

Glu Thr Ala Met Arg Val Ala Ala Gly Ala Ile Ala Lys Lys Tyr Leu
130 135 140

Ala Gln Lys Phe Gly Val Gln Val Arg Gly Tyr Leu Ala Gln Met Gly
145 150 155 160

Asp Val Ser Cys Asp Leu Leu Asp Trp Asp Leu Val Glu Gln Asn Pro
165 170 175

Phe Phe Cys Pro Asp Ala Ser Lys Leu Glu Pro Leu Asp Ala Leu Met
180 185 190

Arg Glu Leu Lys Lys Ala Gly Asp Ser Ile Gly Ala Lys Ile Thr Val
195 200 205

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Val Ala Glu Asn Val Pro Val Gly Leu Gly Glu Pro Val Phe Asp Arg
210 215 220

Leu Asp Ala Asp Leu Ala His Ala Leu Met Ser Ile Asn Ala Val Lys
225 230 235 240

Gly Val Glu Ile Gly Asp Gly Phe Ala Val Val Thr Lys Arg Gly Ser
245 250 255

Glu Asn Arg Asp Glu Ile Thr Pro Gln Gly Phe Gln Ser Asn His Ala
260 265 270

Gly Gly Ile Leu Gly Gly Ile Ser Ser Gly Gln Pro Val Val Ala His
275 280 285

Ile Ala Leu Lys Pro Thr Ser Ser Ile Met Val Pro Gly Gln Thr Ile
290 295 300

Asn Arg Gln Gly Glu Ala Val Glu Met Val Thr Arg Gly Arg His Asp
305 310 315 320

Pro Cys Val Gly Ile Arg Ala Val Pro Ile Ala Glu Ala Met Met Ala
325 330 335

Ile Val Leu Met Asp His Leu Leu Arg Gln Arg Ala Gln Cys Gly Asp
340 345 350

Val Ala Ser Asp Val Pro Arg Trp
355 360

<210> 10
<211> 356
<212> PRT
<213> Haemophilus influenzae

<400> 10

Ala Gly Asn Thr Ile Gly Gln Leu Phe Arg Val Thr Thr Phe Gly Glu
1 5 10 15

Ser His Gly Ile Ala Leu Gly Cys Ile Val Asp Gly Val Pro Pro Asn
20 25 30

Leu Glu Leu Ser Glu Lys Asp Ile Gln Pro Asp Leu Asp Arg Arg Lys
35 40 45

Pro Gly Thr Ser Arg Tyr Thr Thr Pro Arg Arg Glu Asp Asp Glu Val
50 55 60

Gln Ile Leu Ser Gly Val Phe Glu Gly Lys Thr Thr Gly Thr Ser Ile
65 70 75 80

Gly Met Ile Ile Lys Asn Gly Asp Gln Arg Ser Gln Asp Tyr Gly Asp
85 90 95

Ile Lys Asp Arg Phe Arg Pro Gly His Ala Asp Phe Thr Tyr Gln Gln
100 105 110

Lys Tyr Gly Ile Arg Asp Tyr Arg Gly Gly Gly Arg Ser Ser Ala Arg
115 120 125

Glu Thr Ala Met Arg Val Ala Ala Gly Ala Ile Ala Lys Lys Tyr Leu
130 135 140

Arg Glu His Phe Gly Ile Glu Val Arg Gly Phe Leu Ser Gln Ile Gly
145 150 155 160

Asn Ile Lys Ile Ala Pro Gln Lys Val Gly Gln Ile Asp Trp Glu Lys
165 170 175

Val Asn Ser Asn Pro Phe Phe Cys Pro Asp Glu Ser Ala Val Glu Lys
180 185 190

Phe Asp Glu Leu Ile Arg Glu Leu Lys Lys Glu Gly Asp Ser Ile Gly
195 200 205

Ala Lys Leu Thr Val Ile Ala Glu Asn Val Pro Val Gly Leu Gly Glu
210 215 220

Pro Val Phe Asp Arg Leu Asp Ala Asp Leu Ala His Ala Leu Met Gly
225 230 235 240

Ile Asn Ala Val Lys Gly Val Glu Ile Gly Asp Gly Phe Ala Val Val
245 250 255

Glu Gln Arg Gly Ser Glu His Arg Asp Glu Met Thr Pro Asn Gly Phe
260 265 270

Glu Ser Asn His Ala Gly Gly Ile Leu Gly Gly Ile Ser Ser Gly Gln
275 280 285

Pro Ile Ile Ala Thr Ile Ala Leu Lys Pro Thr Ser Ser Ile Thr Ile
290 295 300

Pro Gly Arg Ser Ile Asn Leu Asn Gly Glu Ala Val Glu Val Val Thr
305 310 315 320

E.coli. seq. 1.ST25.txt complete 3.15.2006

Lys Gly Arg His Asp Pro Cys Val Gly Ile Arg Ala Val Pro Ile Ala
325 330 335

Glu Ala Met Val Ala Ile Val Leu Leu Asp His Leu Leu Arg Phe Lys
340 345 350

Ala Gln Cys Lys
355

<210> 11
<211> 343
<212> PRT
<213> Pasteurella multocida

<400> 11

Thr Phe Gly Glu Ser His Gly Ile Ala Leu Gly Cys Ile Val Asp Gly
1 5 10 15

Val Pro Pro Gly Leu Ser Leu Ser Glu Ala Asp Ile Gln Pro Asp Leu
20 25 30

Asp Arg Arg Lys Pro Gly Thr Ser Arg Tyr Thr Thr Pro Arg Arg Glu
35 40 45

Asp Asp Glu Val Gln Ile Leu Ser Gly Val Phe Glu Gly Lys Thr Thr
50 55 60

Gly Thr Ser Ile Gly Met Ile Ile Lys Asn Ala Asp Gln Arg Ser Gln
65 70 75 80

Asp Tyr Gly Asp Ile Lys Asp Arg Phe Arg Pro Gly His Ala Asp Phe
85 90 95

Thr Tyr Gln Gln Lys Tyr Gly Ile Arg Asp Tyr Arg Gly Gly Gly Arg
100 105 110

Ser Ser Ala Arg Glu Thr Ala Met Arg Val Ala Ala Gly Ala Ile Ala
115 120 125

Lys Lys Tyr Leu Arg Glu His Phe Gly Val Glu Val Arg Gly Phe Leu
130 135 140

Ala Gln Ile Gly Asp Val Ala Ile Ala Pro Gln Val Ile Glu Gln Ile
145 150 155 160

Asp Trp Gln Gln Val Asn Ser Asn Pro Phe Phe Cys Pro Asp Pro Ser
165 170 175

E.coli. seq. 1.ST25.txt complete 3.15.2006

Ala Val Glu Lys Phe Asp Glu Leu Ile Arg Gln Leu Lys Lys Glu Gly
180 185 190

Asp Ser Ile Gly Ala Lys Leu Thr Val Val Ala Glu Asn Val Pro Val
195 200 205

Gly Leu Gly Glu Pro Val Phe Asp Arg Leu Asp Ala Asp Leu Ala His
210 215 220

Ala Leu Met Gly Ile Asn Ala Val Lys Ala Val Glu Ile Gly Asp Gly
225 230 235 240

Phe Ala Val Val Asn Gln Arg Gly Ser Ala His Arg Asp Glu Met Thr
245 250 255

Pro Glu Gly Phe Leu Ser Asn His Ala Gly Gly Ile Leu Gly Gly Ile
260 265 270

Ser Ser Gly Gln Pro Ile Val Ala Thr Ile Ala Leu Lys Pro Thr Ser
275 280 285

Ser Ile Thr Ile Pro Gly Arg Ser Val Asn Leu Ala Asn Glu Pro Val
290 295 300

Glu Val Ile Thr Lys Gly Arg His Asp Pro Cys Val Gly Ile Arg Ala
305 310 315 320

Val Pro Ile Ala Glu Ala Met Val Ala Ile Val Leu Leu Asp His Leu
325 330 335

Leu Arg His Lys Ala Gln Asn
340

<210> 12
<211> 358
<212> PRT
<213> Neisseria gonorrhoeae

<400> 12

Ala Gly Asn Thr Phe Gly Gln Ile Phe Thr Val Thr Thr Phe Gly Glu
1 5 10 15

Ser His Gly Ala Gly Leu Gly Cys Ile Ile Asp Gly Cys Pro Pro Gly
20 25 30

Leu Glu Leu Ser Glu Ala Asp Ile Gln Phe Asp Leu Asp Arg Arg Lys
35 40 45

E.coli. seq. 1.ST25.txt complete 3.15.2006

Pro Gly Thr Ser Arg His Val Thr Gln Arg Arg Glu Ala Asp Gln Val
50 55 60

Glu Ile Leu Ser Gly Val Phe Glu Gly Lys Thr Thr Gly Thr Pro Ile
65 70 75 80

Ala Leu Leu Ile Arg Asn Thr Asp Gln Arg Ser Glu Asp Tyr Gly Asp
85 90 95

Ile Ala Thr Ala Phe Arg Pro Gly His Ala Asp Tyr Thr Tyr Trp His
100 105 110

Lys Tyr Gly Thr Arg Asp Tyr Arg Gly Gly Gly Arg Ser Ser Ala Arg
115 120 125

Glu Thr Ala Ala Arg Val Ala Ala Gly Ala Val Ala Lys Lys Trp Leu
130 135 140

Lys Glu Lys Phe Gly Thr Glu Ile Thr Ala Tyr Val Thr Gln Val Gly
145 150 155 160

Glu Lys Lys Ile Arg Phe Glu Gly Ser Glu His Ile Ser Gln Asn Pro
165 170 175

Phe Phe Ala Ala Asn Gln Ser Gln Ile Ala Glu Leu Glu His Tyr Met
180 185 190

Asp Gly Val Arg Lys Ser Leu Asp Ser Val Gly Ala Lys Leu His Ile
195 200 205

Glu Ala Ala Asn Val Pro Val Gly Leu Gly Glu Pro Val Phe Asp Arg
210 215 220

Leu Asp Ala Glu Ile Ala Tyr Ala Met Met Gly Ile Asn Ala Val Lys
225 230 235 240

Gly Val Glu Ile Gly Ala Gly Phe Asp Ser Val Thr Gln Arg Gly Ser
245 250 255

Glu His Gly Asp Glu Leu Thr Pro Gln Gly Phe Leu Ser Asn His Ser
260 265 270

Gly Gly Ile Leu Gly Gly Ile Ser Thr Gly Gln Asp Ile Cys Val Asn
275 280 285

Ile Ala Ile Lys Pro Thr Ser Ser Ile Ala Thr Pro Arg Arg Ser Ile
290 295 300

Asp Ile His Gly Asn Pro Val Glu Leu Ala Thr Arg Gly Arg His Asp
305 310 315 320

Pro Cys Val Gly Leu Arg Thr Ala Pro Ile Ala Glu Ala Met Leu Ala
325 330 335

Leu Val Leu Ile Asp His Ala Leu Arg His Arg Ala Gln Asn Ala Asp
340 345 350

Val Ala Ala Asp Thr Pro
355

<210> 13
<211> 358
<212> PRT
<213> Neisseria meningitidis

<400> 13

Ala Gly Asn Thr Phe Gly Gln Leu Phe Thr Val Thr Thr Phe Gly Glu
1 5 10 15

Ser His Gly Ala Gly Leu Gly Cys Ile Ile Asp Gly Cys Pro Pro Gly
20 25 30

Leu Glu Leu Ser Glu Ala Asp Ile Gln Phe Asp Leu Asp Arg Arg Lys
35 40 45

Pro Gly Thr Ser Arg His Val Thr Gln Arg Arg Glu Ala Asp Gln Val
50 55 60

Glu Ile Leu Ser Gly Val Phe Glu Gly Lys Thr Thr Gly Thr Pro Ile
65 70 75 80

Ala Leu Leu Ile Arg Asn Thr Asp Gln Arg Ser Lys Asp Tyr Gly Asn
85 90 95

Ile Ala Thr Ser Phe Arg Pro Gly His Ala Asp Tyr Thr Tyr Trp His
100 105 110

Lys Tyr Gly Thr Arg Asp Tyr Arg Gly Gly Gly Arg Ser Ser Ala Arg
115 120 125

Glu Thr Ala Ala Arg Val Ala Ala Gly Ala Val Ala Lys Lys Trp Leu
130 135 140

Lys Glu Lys Phe Gly Thr Glu Ile Thr Ala Tyr Val Thr Gln Val Gly
145 150 155 160

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Glu Lys Glu Ile Arg Phe Glu Gly Cys Glu His Ile Ser Gln Asn Pro
165 170 175

Phe Phe Ala Ala Asn His Ser Gln Ile Ala Glu Leu Glu Asn Tyr Met
180 185 190

Asp Ser Val Arg Lys Ser Leu Asp Ser Val Gly Ala Lys Leu His Ile
195 200 205

Glu Ala Ala Asn Val Pro Val Gly Leu Gly Glu Pro Val Phe Asp Arg
210 215 220

Leu Asp Ala Glu Ile Ala Tyr Ala Met Met Gly Ile Asn Ala Val Lys
225 230 235 240

Gly val Glu Ile Gly Ala Gly Phe Asp Ser Val Thr Gln Arg Gly Ser
245 250 255

Glu His Gly Asp Glu Leu Thr Pro Gln Gly Phe Leu Ser Asn His Ser
260 265 270

Gly Gly Ile Leu Gly Gly Ile Ser Thr Gly Gln Asp Ile His Val Asn
275 280 285

Ile Ala Ile Lys Pro Thr Ser Ser Ile Ala Thr Pro Arg Arg Ser Ile
290 295 300

Asp Ile Asn Gly Asn Pro Ile Glu Leu Ala Thr His Gly Arg His Asp
305 310 315 320

Pro Cys Val Gly Leu Arg Ala Ala Pro Ile Ala Glu Ala Met Leu Ala
325 330 335

Leu Val Leu Ile Asp His Ala Leu Arg His Arg Ala Gln Asn Ala Asp
340 345 350

Val Gln Val Asn Thr Pro
355

<210> 14
<211> 357
<212> PRT
<213> Pseudomonas aeruginosa

<400> 14

Ser Gly Asn Thr Tyr Gly Lys Leu Phe Thr val Thr Thr Ala Gly Glu
1 5 10 15

E.coli. seq. 1.ST25.txt complete 3.15.2006

Ser His Gly Pro Ala Leu Val Ala Ile Val Asp Gly Cys Pro Pro Gly
20 25 30

Leu Glu Leu Ser Ala Arg Asp Leu Gln Arg Asp Leu Asp Arg Arg Asn
35 40 45

Pro Gly Thr Ser Arg His Thr Thr Gln Arg Gln Glu Ala Asp Glu Val
50 55 60

Glu Ile Leu Ser Gly Val Phe Glu Gly Lys Thr Thr Gly Thr Pro Ile
65 70 75 80

Gly Leu Leu Ile Arg Asn Thr Asp Gln Lys Ser Lys Asp Tyr Ser Ala
85 90 95

Ile Lys Asp Leu Phe Arg Pro Ala His Ala Asp Tyr Thr Tyr His His
100 105 110

Lys Tyr Gly Val Arg Asp Tyr Arg Gly Gly Gly Arg Ser Ser Ala Arg
115 120 125

Glu Thr Ala Met Arg Val Ala Ala Gly Ala Ile Ala Lys Lys Tyr Leu
130 135 140

Ala Gly Leu Gly Ile Gln Val Arg Gly Tyr Met Ser Gln Leu Gly Pro
145 150 155 160

Ile Glu Ile Pro Phe Arg Ser Trp Asp Ser Val Glu Gln Asn Ala Phe
165 170 175

Phe Ser Pro Asp Pro Asp Lys Val Pro Glu Leu Glu Ala Tyr Met Asp
180 185 190

Gln Leu Arg Arg Asp Gln Asp Ser Val Gly Ala Lys Ile Thr Val Val
195 200 205

Ala Glu Cys Val Pro Pro Gly Leu Gly Glu Pro Ile Phe Asp Arg Leu
210 215 220

Asp Ala Glu Leu Ala His Ala Leu Met Ser Ile Asn Ala Val Lys Gly
225 230 235 240

Val Glu Ile Gly Ala Pro Phe Ala Ser Ile Ala Gln Arg Gly Thr Glu
245 250 255

His Arg Asp Glu Leu Thr Pro Gln Gly Phe Leu Ser Asn Asn Ala Gly
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Gly Ile Leu Gly Gly Ile Ser Ser Gly Gln Pro Ile Val Ala His Leu
275 280 285

Ala Leu Lys Pro Thr Ser Ser Ile Thr Thr Pro Gly Arg Ser Ile Asp
290 295 300

Thr Ala Gly Glu Pro Val Asp Met Ile Thr Lys Gly Arg His Asp Pro
305 310 315 320

Cys Val Gly Ile Arg Ala Thr Pro Ile Ala Glu Ala Met Met Ala Ile
325 330 335

Val Leu Leu Asp Gln Leu Val Arg Gln Arg Gly Gln Asn Ala Asp Val
340 345 350

Arg Val Asp Thr Pro
355

<210> 15
<211> 361
<212> PRT
<213> Helicobacter pylori
<400> 15

Met Asn Thr Leu Gly Arg Phe Leu Arg Leu Thr Thr Phe Gly Glu Ser
1 5 10 15

His Gly Asp Met Ile Gly Gly Val Leu Asp Gly Met Pro Ser Gly Ile
20 25 30

Lys Ile Asp Tyr Asp Leu Leu Glu Asn Glu Met Lys Arg Arg Gln Gly
35 40 45

Gly Arg Asn Pro Arg Lys Glu Asp Asp Lys Val Glu Ile Thr Ser Gly
50 55 60

Val Phe Glu Asp Phe Ser Thr Gly Thr Pro Ile Gly Phe Leu Ile His
65 70 75 80

Asn Gln Arg Ala Arg Ser Lys Asp Tyr Asp Asn Ile Lys Asn Leu Phe
85 90 95

Arg Pro Ser His Ala Asp Phe Thr Tyr Phe His Lys Tyr Gly Ile Arg
100 105 110

Asp Phe Arg Gly Gly Gly Arg Ser Ser Ala Arg Glu Ser Ala Ile Arg
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115

120

125

Val Ala Ala Gly Ala Phe Ala Lys Met Leu Leu Arg Glu Ile Gly Ile
 130 135 140

Val Cys Glu Ser Gly Ile Ile Glu Ile Gly Gly Ile Lys Ala Lys Asn
 145 150 155 160

Tyr Asp Phe Asn His Ala Leu Lys Ser Glu Ile Phe Ala Leu Asp Glu
 165 170 175

Glu Gln Glu Glu Ala Gln Lys Thr Ala Ile Gln Asn Ala Ile Lys Asn
 180 185 190

His Asp Ser Ile Gly Gly Val Ala Leu Ile Arg Ala Arg Ser Ile Lys
 195 200 205

Thr Asn Gln Lys Leu Pro Ile Gly Leu Gly Gln Gly Leu Tyr Ala Lys
 210 215 220

Leu Asp Ala Lys Ile Ala Glu Ala Met Met Gly Leu Asn Gly Val Lys
 225 230 235 240

Ala Val Glu Ile Gly Lys Gly Val Glu Ser Ser Leu Leu Lys Gly Ser
 245 250 255

Glu Tyr Asn Asp Leu Met Asp Gln Lys Gly Phe Leu Ser Asn Arg Ser
 260 265 270

Gly Gly Val Leu Gly Gly Met Ser Asn Gly Glu Glu Ile Ile Val Lys
 275 280 285

Val His Phe Lys Pro Thr Pro Ser Ile Phe Gln Pro Gln Arg Thr Ile
 290 295 300

Asp Ile Asn Gly Asn Glu Cys Glu Cys Leu Leu Lys Gly Arg His Asp
 305 310 315 320

Pro Cys Ile Ala Ile Arg Gly Ser Val Val Cys Glu Ser Leu Leu Ala
 325 330 335

Leu Val Leu Ala Asp Met Val Leu Leu Asn Leu Thr Ser Lys Ile Glu
 340 345 350

Tyr Leu Lys Thr Ile Tyr Asn Glu Asn
 355 360

<210> 16

<211> 432

<212> PRT

<213> *Neurospora crassa*

<400> 16

Met Ser Thr Phe Gly His Tyr Phe Arg Val Thr Thr Tyr Gly Glu Ser
1 5 10 15

His Cys Lys Ser Val Gly Cys Ile Val Asp Gly Val Pro Pro Gly Met
20 25 30

Glu Leu Thr Glu Asp Asp Ile Gln Pro Gln Met Thr Arg Arg Arg Pro
35 40 45

Gly Gln Ser Ala Ile Thr Thr Pro Arg Asp Glu Lys Asp Arg Val Ile
50 55 60

Ile Gln Ser Gly Thr Glu Phe Gly Val Thr Leu Gly Thr Pro Ile Gly
65 70 75 80

Met Leu Val Met Asn Glu Asp Gln Pro Pro Lys Asp Tyr Gly Asn Lys
85 90 95

Thr Met Asp Ile Tyr Pro Arg Pro Ser His Ala Asp Trp Thr Tyr Leu
100 105 110

Glu Lys Tyr Gly Val Lys Ala Ser Ser Gly Gly Gly Arg Ser Ser Ala
115 120 125

Arg Glu Thr Ile Gly Arg Val Ala Ala Gly Ala Ile Ala Glu Lys Tyr
130 135 140

Leu Lys Pro Arg Tyr Gly Val Glu Ile Val Ala Phe Val Ser Ser Val
145 150 155 160

Gly Ser Glu His Leu Phe Pro Pro Thr Ala Glu His Pro Ser Pro Ser
165 170 175

Thr Asn Pro Glu Phe Leu Lys Leu Val Asn Ser Ile Thr Arg Glu Thr
180 185 190

Val Asp Ser Phe Leu Pro Val Arg Cys Pro Asp Ala Glu Ala Asn Lys
195 200 205

Arg Met Glu Asp Leu Ile Thr Lys Phe Arg Asp Asn His Asp Ser Ile
210 215 220

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Gly Gly Thr Val Thr Cys Val Ile Arg Asn Val Pro Ser Gly Leu Gly
225 230 235 240

Glu Pro Ala Phe Asp Lys Leu Glu Ala Met Leu Ala His Ala Met Leu
245 250 255

Ser Ile Pro Ala Thr Lys Gly Phe Glu Val Gly Ser Gly Phe Gly Gly
260 265 270

Cys Glu Val Pro Gly Ser Ile His Asn Asp Pro Phe Val Ser Ala Glu
275 280 285

Asn Thr Glu Ile Pro Pro Ser Val Ala Ala Ser Gly Ala Ala Arg Asn
290 295 300

Gly Ile Pro Arg Pro Lys Leu Thr Thr Lys Thr Asn Phe Ser Gly Gly
305 310 315 320

Ile Gln Gly Gly Ile Ser Asn Gly Ala Pro Ile Tyr Phe Arg Val Gly
325 330 335

Phe Lys Pro Ala Ala Thr Ile Gly Gln Glu Gln Thr Thr Ala Thr Tyr
340 345 350

Asp Gly Thr Ser Glu Gly Val Leu Ala Ala Lys Gly Arg His Asp Pro
355 360 365

Ser Val Val Pro Arg Ala Val Pro Ile Val Glu Ala Met Ala Ala Leu
370 375 380

Val Ile Met Asp Ala Val Leu Ala His Glu Ala Arg Val Thr Ala Lys
385 390 395 400

Ser Leu Leu Pro Pro Leu Lys Gln Thr Ile Asn Ser Gly Lys Asp Thr
405 410 415

Val Gly Asn Gly Val Ser Glu Asn Val Gln Glu Ser Asp Leu Ala Gln
420 425 430

<210> 17
<211> 435
<212> PRT
<213> Arabidopsis thaliana

<400> 17

Met Ala Ser Ser Ser Leu Thr Ser Lys Ser Ile Leu Gly Ser Thr Lys
1 5 10 15

E.coli. seq. 1.ST25.txt complete 3.15.2006

Leu Gly Ser Ser Ser Leu Pro Ser Glu Leu Arg Arg Leu Ser Ser Pro
20 25 30

Ala Val Gln Ile Ser Leu Arg Thr Gln Thr Arg Lys Asn Phe Gln Ile
35 40 45

Gln Ala Thr Gly Ser Ser Tyr Gly Thr His Phe Arg Val Ser Thr Phe
50 55 60

Gly Glu Ser His Gly Gly Gly Val Gly Cys Ile Ile Asp Gly Cys Pro
65 70 75 80

Pro Arg Ile Pro Leu Thr Glu Ser Asp Leu Gln Phe Asp Leu Asp Arg
85 90 95

Arg Pro Gly Gln Ser Arg Ile Thr Thr Pro Arg Lys Glu Thr Asp Thr
100 105 110

Cys Arg Ile Ser Ser Gly Val Ser Glu Gly Met Thr Thr Gly Thr Pro
115 120 125

Ile His Val Phe Val Pro Asn Thr Asp Gln Arg Gly Leu Asp Tyr Ser
130 135 140

Glu Met Ser Val Ala Tyr Arg Pro Ser His Ala Asp Ala Thr Tyr Asp
145 150 155 160

Met Lys Tyr Gly Val Arg Ser Val Gln Gly Gly Gly Arg Ser Ser Ala
165 170 175

Arg Glu Thr Ile Gly Arg Val Ala Pro Gly Ala Leu Ala Lys Lys Ile
180 185 190

Leu Lys Gln Phe Ala Gly Thr Glu Ile Leu Ala Tyr Val Ser Gln Val
195 200 205

His His Val Val Leu Pro Glu Glu Leu Val Asp His Glu Asn Leu Thr
210 215 220

Leu Glu Gln Ile Glu Asn Asn Ile Val Arg Cys Pro Asn Pro Glu Tyr
225 230 235 240

Ala Glu Lys Met Ile Ala Ala Ile Asp Ala Val Arg Thr Lys Gly Asn
245 250 255

ser Val Gly Gly Val Val Thr Cys Ile Val Arg Asn Ala Pro Arg Gly
260 265 270

E.coli. seq. 1.ST25.txt complete 3.15.2006

Leu Gly Thr Pro Val Phe Asp Lys Leu Glu Ala Glu Leu Ala Lys Ala
275 280 285

Cys Met Ser Leu Pro Ala Thr Lys Gly Phe Glu Phe Gly Ser Gly Phe
290 295 300

Ala Gly Thr Phe Leu Thr Gly Leu Glu His Asn Asp Glu Phe Tyr Thr
305 310 315 320

Asp Glu Asn Gly Arg Ile Arg Thr Arg Thr Asn Arg Ser Gly Gly Ile
325 330 335

Gln Gly Gly Ile Ser Asn Gly Glu Ile Ile Asn Met Arg Val Ala Phe
340 345 350

Lys Pro Thr Ser Thr Ile Gly Arg Lys Gln Asn Thr Val Thr Arg Asp
355 360 365

Lys Val Glu Thr Glu Met Ile Ala Arg Gly Arg His Asp Pro Cys Val
370 375 380

Val Pro Arg Ala Val Pro Met Val Glu Ala Met Val Ala Leu Val Leu
385 390 395 400

Val Asp Gln Leu Met Ala Gln Tyr Ala Gln Cys His Leu Phe Pro Ile
405 410 415

Asn Pro Glu Leu Gln Glu Pro Leu Gln Ile Glu Gln Pro Gln Asn Ala
420 425 430

Thr Ala Leu
435

<210> 18
<211> 359
<212> PRT
<213> Clostridium difficile

<400> 18

Met Ser Gly Ile Trp Gly Asn Asn Leu Lys Val Ser Ile Phe Gly Glu
1 5 10 15

Ser His Gly Asn Ala Ile Gly Ile Asn Ile Asp Gly Leu Pro Ser Gly
20 25 30

Ile Glu Leu Asp Leu Asp Lys Ile Asp Lys Glu Met Lys Arg Arg Ala
35 40 45

E.coli. seq. 1.ST25.txt complete 3.15.2006

Pro Gly Lys Asn Ser Ile Ser Thr Ser Arg Asn Glu Ser Asp Ile Pro
50 55 60

Glu Ile Leu Ser Gly Tyr Phe Asn Gly Arg Thr Thr Gly Thr Pro Leu
65 70 75 80

Cys Ala Ile Ile Arg Asn Ser Asp Thr Arg Ser Lys Asp Tyr Gly Glu
85 90 95

Leu Lys Asn Leu Met Arg Pro Gly His Ala Asp Phe Thr Gly Asn Val
100 105 110

Arg Tyr Ser Gly Phe Asn Asp Tyr Arg Gly Gly Gly His Phe Ser Gly
115 120 125

Arg Ile Thr Ala Pro Leu Val Phe Cys Gly Ala Ile Cys Lys Gln Ile
130 135 140

Leu Ser Gln Lys Gly Ile Glu Ile Gly Ala His Ile Lys Lys Ile Lys
145 150 155 160

Asn Ile Glu Asp Met Ser Phe Asp Tyr Val Asn Ile Ser Lys Gln Gln
165 170 175

Leu Ser Asn Leu Gln Thr Leu Glu Leu Pro Leu Leu Asp Leu Ser Lys
180 185 190

Glu Glu Ala Met Lys Asn Thr Ile Ile Asp Ala Lys Asn Gln Gly Asp
195 200 205

Ser Val Gly Gly Ile Ile Glu Cys Ala Val Val Gly Ile Asn Val Gly
210 215 220

Leu Gly Asn Pro Phe Phe Asp Ser Val Glu Ser Thr Leu Ser His Leu
225 230 235 240

Leu Phe Ser Val Pro Ala Val Lys Gly Val Glu Phe Gly Leu Gly Phe
245 250 255

Glu Leu Ala Asp Met Tyr Gly Ser Gln Ser Asn Asp Glu Met Tyr Tyr
260 265 270

Glu Gly Asn Gln Val Lys Ser Lys Thr Asn Asn Asn Gly Gly Ile Ile
275 280 285

Gly Gly Ile Thr Thr Gly Met Pro Ile Ile Phe Lys Val Ala Ile Lys
290 295 300

Pro Thr Pro Ser Ile Ser Arg Gln Gln Asn Thr Val Asn Ile Lys Asp
305 310 315 320

Lys Lys Asp Asp Ile Leu Tyr Ile Lys Gly Arg His Asp Pro Cys Ile
325 330 335

Val Gln Arg Ala Ile Pro Val Ile Glu Ala Val Thr Ala Ile Gly Ile
340 345 350

Phe Asp Leu Met Lys Gly Arg
355

<210> 19
<211> 536
<212> PRT
<213> Toxoplasma gondii

<400> 19

Met Ser Ser Tyr Gly Ala Ala Leu Arg Ile His Thr Phe Gly Glu Ser
1 5 10 15

His Gly Ser Ala Val Gly Cys Ile Ile Asp Gly Leu Pro Pro Arg Leu
20 25 30

Pro Leu Ser Val Glu Asp Val Gln Pro Gln Leu Asn Arg Arg Arg Pro
35 40 45

Gly Gln Gly Pro Leu Ser Thr Gln Arg Arg Glu Lys Asp Arg Val Asn
50 55 60

Ile Leu Ser Gly Val Glu Asp Gly Tyr Thr Leu Gly Thr Pro Leu Ala
65 70 75 80

Met Leu Val Trp Asn Glu Asp Arg Arg Pro Gln Glu Tyr His Ala Leu
85 90 95

Ala Thr Val Pro Arg Pro Gly His Gly Asp Phe Thr Tyr His Ala Lys
100 105 110

Tyr His Ile His Ala Lys Ser Gly Gly Gly Arg Ser Ser Ala Arg Glu
115 120 125

Thr Leu Ala Arg Val Ala Ala Gly Ala Val Val Glu Lys Trp Leu Gly
130 135 140

Met His Tyr Gly Thr Ser Phe Thr Ala Trp Val Cys Gln Val Gly Asp
145 150 155 160

E.coli. seq. 1.ST25.txt complete 3.15.2006

Val Ser Val Pro Arg Ser Leu Arg Arg Lys Trp Glu Arg Gln Pro Pro
165 170 175

Thr Arg Gln Asp Val Asp Arg Leu Gly Val Val Arg Val Ser Pro Asp
180 185 190

Gly Thr Thr Phe Leu Asp Ala Asn Asn Arg Leu Tyr Asp Glu Arg Gly
195 200 205

Glu Glu Leu Val Glu Glu Glu Asp Lys Ala Arg Arg Arg Leu Leu Phe
210 215 220

Gly Val Asp Asn Pro Thr Pro Gly Glu Thr Val Ile Glu Thr Arg Cys
225 230 235 240

Pro Cys Pro Ser Thr Ala Val Arg Met Ala Val Lys Ile Asn Gln Thr
245 250 255

Arg Ser Leu Gly Asp Ser Ile Gly Gly Cys Ile Ser Gly Ala Ile Val
260 265 270

Arg Pro Pro Leu Gly Leu Gly Glu Pro Cys Phe Asp Lys Val Glu Ala
275 280 285

Glu Leu Ala Lys Ala Met Met Ser Leu Pro Ala Thr Lys Gly Phe Glu
290 295 300

Ile Gly Gln Gly Phe Ala Ser Val Thr Leu Arg Gly Ser Glu His Asn
305 310 315 320

Asp Arg Phe Ile Pro Phe Glu Arg Ala Ser Cys Ser Phe Ser Glu Ser
325 330 335

Ala Ala Ser Thr Ile Lys His Glu Arg Asp Gly Cys Ser Ala Ala Thr
340 345 350

Leu Ser Arg Glu Arg Ala Ser Asp Gly Arg Thr Thr Ser Arg His Glu
355 360 365

Glu Glu Val Glu Arg Gly Arg Glu Arg Ile Gln Arg Asp Thr Leu His
370 375 380

Val Thr Gly Val Asp Gln Gln Asn Gly Asn Ser Glu Asp Ser Val Arg
385 390 395 400

Tyr Thr Ser Lys Ser Glu Ala Ser Ile Thr Arg Leu Ser Gly Asn Ala
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405 410 415

Ala Ser Gly Gly Ala Pro Val Cys Arg Ile Pro Leu Gly Glu Gly Val
420 425 430

Arg Ile Arg Cys Gly Ser Asn Asn Ala Gly Gly Thr Leu Ala Gly Ile
435 440 445

Thr Ser Gly Glu Asn Ile Phe Phe Arg Val Ala Phe Lys Pro Val Ser
450 455 460

Ser Ile Gly Leu Glu Gln Glu Thr Ala Asp Phe Ala Gly Glu Met Asn
465 470 475 480

Gln Leu Ala Val Lys Gly Arg His Asp Pro Cys Val Leu Pro Arg Ala
485 490 495

Pro Pro Leu Val Glu Ser Met Ala Ala Leu Val Ile Gly Asp Leu Cys
500 505 510

Leu Arg Gln Arg Ala Arg Glu Gly Pro His Pro Leu Leu Val Leu Pro
515 520 525

Gln His Ser Gly Cys Pro Ser Cys
530 535